Pettersson's observations made by the aid of his ingenious self-registering appliances are of very great interest, but it must be pointed out that the relations between the phases of the moon and the waves are not very well marked. Further, it is well known that similar oscillations in the water-layers of the Scottish lochs are produced by the varying winds that blow over the surface.[1]

Nordgaard has compiled an account recording the months of the year when southern Atlantic fish-species are stranded on the coasts of Norway, and has found that such strandings generally occur from January to May. On this subject he remarks: "It is hardly accidental that so many specimens of these pelagic deep-sea fishes arrive on the coast during the first months of the year, during the time of the cod fisheries (when the shoals of cod appear in order to spawn). It is obvious that during this season especially the deeper layers move towards the land, probably as a compensation current in deep water caused by the off-shore winds forcing the surface layers out to sea." If we look at Fig. 509, showing the annual changes of temperature in the sea off western Norway, we shall see that towards the new year and during spring a marked drop in temperature occurs in the surface layers. We must take it for granted that the organisms consequently tend to move towards the surface, the specific gravity and viscosity of the water increasing enormously compared with the conditions in warmer seasons.

These conditions and their influence upon animal life are to a great extent mere guess-work, but they open up a vast field for future oceanic research.

Nutrition

Sir John Murray divides marine deposits (see p. 161) into two main groups: (1) *Terrigenous deposits* formed in deep and shallow water close to the land masses; and (2) *Pelagic deposits* formed in deep water remote from land.

Corresponding to this division we may define the nourishment of marine animal life as derived from two main sources: (1) *Organic detritus* carried into the sea from land or formed by disintegration of the plants of the coast belt and the animals living upon them; and (2) *Pelagic plants*.

As a third source, Pütter has suggested the organic com-

[1] See Murray, *Scott. Geogr. Mag.*, vol. iv. p. 345, 1888, and vol. xiii. p. 1, 1897.